

ANALYSIS OF EXTRAPOLATION METHODS FOR SOLVING VARIATIONAL INEQUALITIES

D. Kuyanov, A. Zykina

Omsk State Technical University, Omsk
e-mail: dmitry.kuyanov@gmail.com

The report examines the problem of effective implementation of mathematical methods for solving variational inequalities. Mathematical modeling plays an important role in the solution of scientific, technical, economic tasks. For solving such problems of the real sector of the economy is often necessary to put and solve optimization problems. In turn, the optimization problem is reduced to the problem of solving a variational inequality. At the same time modern calculations are based on the application of parallel algorithms. Earlier [1, 2] were parallelized varieties extragradient methods. It was decided to consider methods of solving variational inequalities from [3] and to conduct theoretical evaluation of the efficiency of parallelization. Various possibilities were explored gradient methods, the multiplier method and extraproximal method.

In implementations of each method identified the most expensive computationally operations (for example, multiplying a matrix by a vector or matrices addition). Also stood out the blocks, the implementation of which is not dependent on the results of calculations each other.

Using the methodology of the assessment acceleration of the parallel algorithm [4] for each method was carried out the corresponding theoretical assessment. The evaluation is based on determining the share of parallel computing in the implementation of the method. In the course of work identified the most favourable from the point of view of acceleration methods. One of such methods is extragradient method for solving equilibrium problems related restrictions. We have also identified methods, the use of parallelism in which will give you less positive effect. So, for example, is a variant's extragradient method for tasks related restrictions.

In the General case, the application of parallel technologies in the implementation of methods for solving variational inequalities allows to efficiently solve important strategic tasks, for example, the task of building a sustained information systems in the Arctic regions of Russia.

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